

# DRIP BERM HAVING HYDROPHOBIC AND HYDROCARBON RETENTIVE PROPERTIES

## Cross Reference to Related Application

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This application claims priority from United States Provisional Patent Application No. 60/320,114 filed April 16, 2003 entitled Drip Berm Having Hydrophobic and Hydrocarbon Retentive Properties.

## 10 Field of the Invention

This invention relates to a framework for retaining a replaceable mat having specific hydrophobic and hydrocarbon retentive properties, and in particular to a berm frame which securely retains the mat by clamping the edges of the mat between a set of clamshell-  
15 like jaws that interlock with edge trim forming a berm around the mat.

## Background of the Invention

Ultrasonically bonded melt-blown polypropylene material such as is  
20 manufactured by Spilltech Industries Inc. and marketed as WOB 1250 or QPB K50K Oil Only Pads™ are in use in industrial applications for quick clean up of petroleum and chemical spills. Such material has a capacity for the selective retention of hydrocarbons yet has hydrophobic qualities, which allows unimpeded through water flow without unwanted hydrocarbon migration.

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Use of such material is ideal as a mat to trap small amounts of accidentally spilled hydrocarbon based liquids at either a commercial or residential site to enhance safety due to slippage, and protect the environment. For example, it may be utilized as a floor covering in vehicle service bays, at locations where vehicles are parked, such as bus and taxi

stands, in commercial kitchen facilities where cooking oil is handled, or at other locations where small amounts of such liquids may be expected to be spilled.

5       The use of a mall mat of such material as a floor or ground covering without being secured within a frame has been found to be generally impractical. The mat is subject to accidental movement from its intended place of use, either as the site is being cleaned up, by foot traffic, or by air currents such as wind. The mat alone cannot be easily secured in place on an asphalt or concrete slab.

10       In the prior art the application is aware of Unites State Paten no. 5,834,385 which reveals a mat having an exterior comprising hydrophobic, liquid permeable material enclosing an inner layer of absorbent material. This product primarily absorbs oil spilled on water and retains absorbed oil only inside the absorbent material within the mat.

15       In addition, applicant is also aware of United States Patent No. 5,928,751 which describes a drip berm having separate upper and lower areas. The upper area accepts an oil retaining pad. The lower area contains granular anchoring material. The oil-retaining pad is retained within the upper area by means of a screen.

20       In addition, applicant is also aware of United States Patent No. 5,020,638 which describes a vehicle liquid drip catching system composed of a tray receptacle and an absorbent pad retained within the tray.

25       In addition, applicant is also aware of United States Patent No. 6,446,275 which describes a surface protection system mat consisting of a cartridge top, and absorbent core, and a base unit. The top is perforated to allow spilled liquids to drain into the absorbent core.

      In addition, applicant is also aware of United States Patent No. 4,875,537 which describes a disposable oil absorbent drip pad assembly for a vehicle consisting of a bottom

layer of a metallic screen material and a top layer of oil absorbent material, bound peripherally by a fiberglass channel.

5 In addition, applicant is also aware of United States Patent No. 4,484,661 which describes a drip pan for vehicles that can be used individually or assembled with an array of pans to catch drippings from parked vehicles.

In addition, applicant is also aware of United States Patent No. 6,258,430 which describes a portable parking mat and berm which secures the absorbent mat by a snap together  
10 frame that retains the mat by a variety of means.

#### Summary of the Invention

The present invention provides a frame into which a mat having specific  
15 hydrophobic and hydrocarbon retentive properties may be securely retained. The mat receiving frame clamps the perimeter of the mat using a clamp-like mechanism. Retentive teeth may be provided that piercingly engage the mat fabric and retain it within the frame. In one embodiment, the frame which may be interlocked with like frames in order to cover a larger area with the framed mat. The perimeter edge of the frame may be contoured gently  
20 inwardly and upwardly, from the bottom surface to the top surface, to minimize impact by cleaning equipment or foot traffic against the perimeter edge and reduce accidental repositioning or movement of the mat and frame.

The objects of this invention may be achieved in whole or in part by a frame for  
25 removably retaining a commercially available mat, the mat manufactured from materials which are designed to absorb and retain hydrocarbons and allow water to pass through.

The frame may be manufactured by way of example from polypropylene plastic formed into hinged clamps with barbed surfaces to engage and retain the mat material at its perimeter.

5               The clamps include means to engage adjacent clamps or edge trim. This allows multiple sections of mat and frames to be co-joined to cover larger areas than a single mat. The edge trim finishes the frame with a sloped surface that improves egress onto and off of the mat.

10             The mat and frame of the present invention works in combination with the pad, clamps, trim, and the assembled whole may be secured to a floor or other receiving surface by screws, bolts or the like fasteners, for example using apertured tabs mounted to each corner of the mat and frame.

15             In summary, the drip berm according to the present invention, being adapted for mounting onto a drip mat having circumferential edges extending contiguously around the circumference thereof, includes one or more inner berm frame members and one or more cooperating outer berm frame members. Each inner berm frame member, herein also referred to as an inner berm member, is mountable contiguously around the circumferential edges of  
20 the drip mat. Each outer berm frame member, herein also referred to as an outer berm member, is mountable along an inner edge of the outer berm member contiguously along or around an outer edge of, or perimeter of a frame formed by the inner berm member or members.

25             Each inner berm member includes at least one clamp member for mounting onto the circumferential edges of the drip mat. Each clamp member includes a pair of jaws for mounting inwardly of the circumferential edges of the drip mat. The jaws are pivotable about a clam-shell hinge so as to, in a closed position, engage and clamp the circumferential edges of the drip mat between the pair of jaws, and so as to, in an open position, release the

circumferential edges of the drip mat from between the pair of jaws. The outer berm members cooperate, when mounted onto the inner berm members, to lock the pair of jaws in the closed position. The clamp member may be co-extensive with the inner berm member.

5           A rigid flange is mounted to each jaw of the pair of jaws so as to extend in oppositely disposed relation to each jaw. The hinge is disposed so as to provide a fulcrum between each jaw and its corresponding flange. Each flange has a first locking means disposed on its corresponding outer perimeter. The inner edge of each outer berm member has a second locking means thereon for interlocking mating with the first locking means. The first  
10 locking means on each flange cooperates with each other when the pair of jaws are in the closed position so as to releasably interlock with the second locking means. When the cooperating first locking means, that is the first locking means on each jaw are cooperatively aligned with each other, and so may be releasably interlocked with the second locking means, then the pair of jaws may be locked in the closed position by the interlocking of the first and  
15 second locking means.

          In one embodiment, the first locking means may include at least one first male mating member and at least one first female receiver, and the second locking means may include at least one second male mating member and at least one second female receiver. In  
20 this embodiment the first male mating member mates with the second female receiver and the second male mating member mates with the first female receiver. For example, the first and second locking means may be dove-tail shaped male members forming dove-tail shaped female receivers therebetween. The at least one first male mating member, the at least one first female receiver, the at least one second male mating member, and the at least one second  
25 female receiver may be each co-extensive spaced arrays of the male mating members and female receivers. The dove-tail shaped male members may be co-extensive spaced arrays of dove-tail shaped male members for forming a continuous dove-tail joint between the inner and outer berm members.

Advantageously, the inner berm members are also mountable back-to-back to each other so as to oppositely dispose corresponding pairs of jaws. The first locking means on a first of the inner berm members are mountable to the first locking means on a second of the inner berm members in the back-to-back pair of inner berm members so as to lock the pair of jaws on the first and second inner berm members in the closed position, whereby the drip berm may be expanded to form a larger frame to cover a larger area with a plurality of drip mats mounted in the expanded frame.

Further advantageously, the inner and outer berm members, when mounted to each other, form, in lateral cross-section, a smoothly contoured profile rising upwardly from the inner edge of the inner berm member and from the outer edge of the outer berm member.

#### Brief Description of the Drawings

Figure 1 is a perspective view of the mat and frame assembly with mat, clamps, and trim of the present invention.

Figure 2 is a partially exploded perspective view of the mat and frame with some of the trim removed.

Figure 3 is a perspective view of the mat and frame without trim attached..

Figure 4 is a perspective partially exploded view of the mat and frame with one clamp removed.

Figure 5 is a perspective view of a closed clamp.

Figure 6 is a perspective view of an open clamp.

Figure 7 is a perspective view of the corner trim of the present invention.

Figure 8 is a perspective view of the side trim of the present invention.

5 Figure 9 is a perspective view of 4 interlocked mat and frames.

Figure 9a is an enlarged view of Figure 9.

10 Figure 10 is a shaded perspective view of the mat and frame assembly.

Figure 11 is a shaded perspective view of the mat and frame without trim.

#### Detailed Description of Embodiments of the Invention

15 With reference to the drawing figures wherein similar characters of reference denote corresponding parts in each view, the mat frame assembly 5 secures a hydrophobic, hydrocarbon retentive mat 1 within a berm formed by clamps 2 positioned around the perimeter of the mat 1. The berm primarily functions to retain and locate the mat in a position for desired use.

20 In instances of single mat use the clamps 2 are locked and finished with corner trim 3 and edge trim 4 by engaging said clamps and trim components using dove tail connections 8.

25 In instances of multiple mat use the clamps 2 are locked by and adjoining clamp by engaging the dovetails of each clamp when positioned back to back as shown in figure 9. The outer perimeter of the multiple mat assembly is secured by engaging the dovetails 8 of trim 3 and 4 with the clamps 2.

Clamp 2 is hinged. It opens to accept the edge of the mat 1. Both the top and bottom half of the clamp contains rows of teeth 7 shown in the open clamp of figure 6. These teeth perforate and engage the mat 1 when the clamp is closed. Each clamp is locked closed by the insertion of either an adjoining clamp or a trim component 3 and 4 into the dove tail slots 8.

The trim components 3 and 4 are outwardly sloped down and contain dovetail slots 8 on its inside vertical surface that mate with the dovetail slots on the outside vertical surface of the clamp 2. The trim locks the clamp when installed so as to retain the hydrocarbon retentive mat. Further the trim can be fastened to a surface by lag screws or similar fastening device to fix the mat assembly in a specific location.

As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.